



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/768,153

02/02/2004

Tomoko Miyahara

118505

7247

25944

7590

07/07/2009

OLIFF & BERRIDGE, PLC

P.O. BOX 320850

ALEXANDRIA, VA 22320-4850

EXAMINER

LUND, JEFFRIE ROBERT

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

07/07/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/768,153	Applicant(s) MIYAHARA ET AL.	
	Examiner Jeffrie R. Lund	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-18,33-35 and 37-55 is/are pending in the application.
- 4a) Of the above claim(s) 7-14,33,43-50 and 55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-6,15-18,34,35,37-42 and 51-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 6 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The newly added limitation requires that the gas decomposer is separate and does not contact the synthesizing portion, while claims 6 and 42 require that the decomposer be placed on the surface of the synthesizing portion. It is not possible for the decomposer to be placed on the synthesizing portion and separate from the synthesizing portion.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 4, 6, 15-18, 34, 35, 37-40, 42, and 51-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harutyunyan et al, US Patent Application Publication 2001/0053344 A1, in view of Sugimoto et al, JP 2003-313017.

Harutyunyan et al teaches a carbon nanotube manufacturing apparatus, comprising: a reaction tube 11 in which a carbon nanotube is grown by vapor phase

growth; a gas supplying pipe 18 that supplies a carbon-containing raw material 16 carried on a gas flow to an interior of the reaction tube; a heating furnace 12 to heat the interior of the reaction tube; a porous gas decomposer 30 that is placed in the reaction tube to decompose the carbon-containing raw material upon contact with the gas flow; synthesizing portion coated with a metal catalyst 34 that is placed in the reaction tube downstream of the gas decomposer and continuously supplied with the decomposed carbon-containing raw material, which has been carried on the gas flow to an outside of the gas decomposer, to synthesize a carbon nanotube. (Figure 1)

Harutyunyan et al differs from the present invention in that Harutyunyan et al does not teach that the gas decomposer is a molecular sieve or zeolite having a pore diameter of 0.3 to 2nm, and separate from and does not contact the synthesizing portion.

Sugimoto et al teaches a gas decomposer that is a zeolite. (Abstract)

The motivation for replacing the porous gas decomposer of Harutyunyan et al with the zeolite gas decomposer is to supply a porous gas decomposer that has a uniform pore size to more uniformly distribute and decompose the raw material gas.

The motivation for optimizing the pore size is to control the type and amount of raw material gas decomposed by the decomposer. It was held in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform

differently than the prior art device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04 (IV)(A))

The motivation for separating porous gas decomposer from the synthesizing portions is to enable better control of the ratio of areas between the gas decomposer and synthesizing portions and enable easier removal of the carbon nanotubes. Furthermore it was held in *In re Dulberg*, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961) that making elements separable is obvious.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the porous gas decomposer of Harutyunyan et al with the zeolite gas decomposer of Sugimoto et al, optimize the pore size, and to separate the gas decomposer and synthesizing portion.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

5. Claims 1, 4, 5, 34, 37, 40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wen et al, US Patent 5,702,532, in view of Sugimoto et al, JP 2003-313017.

Wen et al teaches a carbon nanotube manufacturing apparatus, comprising: a reaction tube 20; a gas supplying pipe 16 for supplying a raw material gas; a heating furnace 25 to heat the interior of the reaction tube; a gas decomposer (area of the susceptor 21 adjacent the cracking zone 28) that is placed in the reaction tube to decompose the raw material gas upon contact with the gas flow; synthesizing portion 23

that is placed in the reaction tube, downstream of the gas decomposer, and continuously supplied with the raw material gas. (Figure 4) The synthesizing portion 23 rotates about its center; therefore, the synthesizing portion is separate from and does not contact the gas decomposer. The specific raw material gas supplied to the reaction tube and the material grown is an intended use of the apparatus. Wen et al is capable of supplying a carbon-containing raw material gas and forming nanotubes.

Wen et al differs from the present invention in that Wen et al does not teach that the gas decomposer is a molecular sieve or zeolite having a pore diameter of 0.3 to 2nm.

Sugimoto et al teaches a gas decomposer that is a zeolite. (Abstract)

The motivation for adding the zeolite gas decomposer of Sugimoto et al to the apparatus of Wen et al is to increase the area of the gas decomposer to improve the efficiency of the gas decomposer.

The motivation for optimizing the pore size is to control the type and amount of raw material gas decomposed by the decomposer. It was held in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04 (IV)(A))

Therefore it would have been obvious to one of ordinary skill in the art at the time

the invention was made to add the zeolite gas decomposer of Sugimoto et al to the apparatus of Wen et al and to optimize the pore size.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

6. Claims 15-18, 35, 38, 39, and 51-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wen et al and Sugimoto et al as applied to claims 1, 4, 5, 37, 40, and 41 above, and further in view of Harutyunyan et al, US Patent Application Publication 2001/0053344 A1.

Wen et al and Sugimoto et al differ from the present invention in that Wen et al and Sugimoto et al does not teach a metal catalyst.

Harutyunyan et al was discussed above and teaches a metal catalyst.

The motivation for adding the metal catalyst of Harutyunyan et al in the apparatus of Wen et al and Sugimoto et al is to enable the apparatus of Wen et al and Sugimoto et al to use the metal catalyst to form carbon nanotube as taught by Harutyunyan et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the metal catalyst of Harutyunyan et al to the apparatus of Wen et al and Sugimoto et al.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Response to Arguments

7. Applicant's arguments with respect to claims 1, 4-18, 33-35, and 37-55 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (10:00 am - 9:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number:
10/768,153
Art Unit: 1792

Page 8

/Jeffrie R. Lund/
Primary Examiner
Art Unit 1792

JRL
7/5/09